# TRMM Flight Operations Summary

July 7, 1999

# FOT Overview

- Key Issues to be discussed
  - FOT Staffing and project status
  - PSIB Counter Patch
  - Solar Array Parking Status
  - CERES operational change status
  - Y2K conversion status
  - Subsystem Overview

# FOT Overview

- Operations Status - Engineering Staff
  - Flight Ops Summary - Lou Kurzmiller
  - Training and Certification Status - Ave Kludze
  - Thermal, Electrical, & Power - Ave Kludze
  - RCS - Andy Calloway
  - Deployables - Joe Kowalski
  - ACS, FDS, C&DH, RF, & CERES - Ed Weidner
  - VIRS - Ave Kludze
  - TMI & PR - Joe Kowalski
  - LIS - Andy Calloway
  - Ground System & Y2K upgrade - Ed Weidner

# Flight Operations Summary

- Staffing
  - Losing three Console Analysts in July
    - » Offer letters out to three replacements
      - One acceptance: expected start date - 19 July
      - Expect acceptance by the remaining two
  - Will cover remaining console support this month internally

# Flight Operations Summary

- Overall Support in June
  - Supported 496 SN events
    - » Timing problem at STGT on 30 June
      - Lost TDE & TDW for about 4 hrs
      - Remained on TDS & 171 for rest of GMT as precaution
      - ~4 Blind Acquisitions & manual data playbacks - successful
  - Recovered all available science and housekeeping data
  - 7 Delta V maneuvers but no Yaw maneuver in June ( +X Forward)

# Training

- Most recent hire preparing to take final test for Command Control Certification
- Review of subsystem Certification Test in progress
  - The goal is to include new configurations with the IP lines & GTAS

# Thermal Subsystem

- Thermal subsystem performed nominally during the month of June
- High thermal conditions experienced on solar array drive remains a serious concern - monitoring continues
- No open Anomaly or Event Reports
- No outstanding issues

# Electrical Subsystem

- Electrical subsystem performed nominally
- No open Anomaly or Event Reports
- No outstanding issues

# Power Subsystem

- Batteries operating nominally at 100% SOC
- PSIB Memory dump performed on 99-174
  - Enables FSW to verify no other subroutine(s) is frozen
  - Creates a location map of all pertinent  subroutines for the FOT
  - Hex commands are being tested by FSW for the other subroutines
- Open issues
  - Under what conditions would charge settings be changed for failed solar array scenario, especially for Normal Ops Power management?
- Open Anomalies
  - #55 Battery 2 Cell 1 Hitting YH and RH limits

# RCS Subsystem

- RCS performed nominally through Delta-V maneuvers #101 - #107
  - #106 was only the 2nd maneuver out of 30 in which FDCs 112/113 would have tripped with the original limit of 0.51° in place
- Fuel remaining is 716.73 kg of hydrazine
- All operating temperatures remain nominal
- All heater operations remain nominal
- No Open RCS Anomaly or Event Reports
- All Catbed temperatures are well above the 32° recommended firing level using the new 45 minute on-time

# Deployables Subsystem

- -Y solar array drive reached a max of 36° C (yellow high 42° C) in the month of June
- -Y Solar Array Readiness Review
  - Rejected parking the -Y solar array at 30°
    - » Determined that power management would have to be done at certain beta angles/seasons
  - FOT Training will focus on solar array failure identification and early contingency steps
    - » Failed array checklist is finalized

# ACS Subsystem

- Closed Issues
  - Parking of -Y solar array
    - » Contingency Tables (54 & 66) generated and tested
    - » Contingency plan to fire one-shot thruster pulses tested
    - » FDC changes with parking the -Y Solar Array
      - No planned changes except FDC #113 (Commanded vs. Sensed Position, -Y)
    - » ACS NASA engineers finished testing of parked array scenario with yaw maneuver and failed reaction wheel
  - Modified FDC # 9-12 consecutive period limit from 20 sec to 5 min (Next period will be Beta=54° on 99-212)

# ACS Subsystem

- Open Issues
  - Budget approval for Yaw update changes?
    - » Changes desired by September if approved
  - AR #60 - TDRS EPVs still sometimes fail in position and velocity following TDRS maneuvers
    - » New table 85 with updated position & velocity numbers being generated and tested at the STTF
  - Parking of -Y solar array
    - » ACE RAM patch delivery needed to reduce torque gain in Safehold
    - » Looking into the possibility of uplinking new ACS tables 54&66 now, possibly with adjusted values
    - » Looking into the possibility of pitching spacecraft to warm PR in Safehold or Sun Acq
  - Considering possible actions for future increase of array oscillations

# FDS Subsystem

- No UTCF Adjustments performed
- Invalid Stream ID due to VIRS on 99-176
- Q-starts and Flywheel

# C&DH Subsystem

- No FS Adjust performed
  - Drifted positively for short period
- PR Retry error on 99-153
- EDACs

# RF Subsystem

- Center frequencies still steady
- Loss of ~12 min of event on 99-169 due to bad weather at WSC (ER#105)

# CERES Instrument

- Australia field campaign began on June 19 (170)
  - Collected one more data point for threshold/voltage relation on 99-181
  - No testing from July 6 to 12 (187-193)
- Open issues
  - Awaiting closure of Anomaly Report #69 - CERES DAA High Voltage on +15 V converter
  - CERES removal from load-shed work continues
    - » Awaiting new TSMs for CERES current monitoring

# VIRS Instrument

- Voltages and temperatures are nominal
- Anomaly Report #56 (VIRS Reset) is still open
  - Will be flagged “inactive” in the SOAR database
- No Anomaly or Event Reports
- No outstanding issues to report

# TMI Instrument

- All temperatures, currents, and voltages are within limits
- No Open Issues

# PR Instrument

- All temperatures, currents, and voltages are within limits
- No NASDA command requests for the month of June
- Open Issues
  - Possibility of opening PR survival heater relays to ensure power positive state in Sun Acq or Safehold if the -Y array fails
    - » Documents indicate that the lowest Qualifying Temperature of the components in a non-operating condition is -30° C
      - Have seen low temperatures of approximately -22° in past Sun Acq anomalies which is the turn-on setpoint for the -Y panel PR survival heater

# LIS Instrument

- All currents, voltages, and temperatures remain nominal
- MSFC realtime command request executed on 99-173 - June 22

# Ground System

- FEP #1 failed on 99-152, causing failover
- New tape drive on string #1 on 99-166
- Unplanned power outage on 99-168
- Jukebox removed on 99-169
- STGT failure on 99-171 caused all events to be moved to TDS and 171 at WSGT (ER #106) - caused one late acq
- X-term memory upgrades performed - all above 14 MB RAM

# Y2K

- String 3 awaiting final rollover testing before operations testing
- TSDIS SSH request approved and awaiting purchase of software
  - Possible hardwire to MOC being considered
  - Physical connection may already exist